



Amendments to the claims of U.S. application number 10/556,026 .

"OPTICAL COORDINATE INPUT DEVICE COMPRISING FEW ELEMENTS"

Claim 1 (currently amended): An input apparatus of computerized device for measuring an object's relative location within a predefined measurement space near the computerized device wherein said apparatus is positioned at a single viewing point, said apparatus is comprised of:

- a. at least one light emitting source transmitting light extending over said ~~pre-defined~~ predefined measurement space;
- b. a light-receiving unit comprised of at least two photo sensing units for receiving scattered light rays from the object wherein said photo sensing units are placed at far edges of said apparatus creating an optimal viewing angle in relation to the measurement space;
- c. at least two lenses positioned in front of said photo sensing units for condensing said scattered light rays ~~wherein said lenses have approximately identical shapes~~;
- d. a spectrum filter positioned ~~in front of said lenses in the route of said light rays~~ wherein said spectrum matches the light spectrum emitted from said light sources;

wherein the location of the object is calculated using trigonometric and statistical methods on the basis of received light intensity and analysis of differences between at least two captured light images, said differences effected from different viewing angles.

Claim 2 (currently amended): The apparatus of claim 1 wherein said at least two photo sensing units are ~~located within~~ part of a single electronic chip.

Claim 3 (currently amended): The apparatus of claim 1 wherein said light-receiving unit is comprised of at least one ~~linear CCD array or a light sensitive linear CMOS array unit~~ photo sensing electronic chip.

Claim 4 (currently amended): The apparatus of claim 1 wherein said light-receiving unit is comprised of at least one ~~long~~ CCD or one ~~long~~ light sensitive CMOS unit.

Claims 5-8 (canceled)

Claim 9 (original): The apparatus of claim 1 wherein said at least two photo sensing units are angled to each other and said at least two lenses are aligned at optimal distances from said photo sensing units so that the image of an object, placed at various locations within the measurement space, is projected into the active area of said photo sensing units and optimal image focus is achieved.

Claims 10-12 (canceled)

Claim 13 (currently amended): ~~The apparatus of claim 1~~ The apparatus of claim 3 further comprising at least one opto-electric shutter means for blocking lenses for a controllable time interval.

Claims 14-15 (canceled)

Claim 16 (currently amended): ~~The apparatus of claim 1~~ The apparatus of claim 3
wherein said apparatus is positioned at a screen display corner.

Claim 17 (canceled)

Claim 18 (currently amended): ~~The apparatus of claim 1~~ The apparatus of claim 3
further comprising additional light receiving unit and additional respective units of at least one cylindrical or toroidal lens and a light filter unit positioned in front of said additional light receiving unit, wherein said additional units enable to measure a third dimension of said measured object.

Claim 19 (canceled)

Claim 20 (currently amended): ~~The apparatus of claim 1~~ The apparatus of claim 3
wherein said measured object includes emitting light means, and no light emitting source is positioned at said apparatus.

Claims 21-24 (canceled)

Claim 25 (original): The apparatus of claim 1 wherein said light receiving unit is comprised of only one single photo sensing unit, at least four lenses are placed in front of said photo sensing unit, wherein at least two lenses out of said four lenses are tilted towards different sections of said measurement space.

Claim 26 (original): The apparatus of claim 1 wherein said light receiving unit comprised of only one single photo sensing unit, at least four lenses are placed in front of said photo sensing unit, all having parallel planes in relation to said photo sensing unit.

Claim 27 (original): The apparatus of claim 1 wherein at least four lenses are used, all having parallel planes in relation to said at least two photo sensing units.

Claim 28 (currently amended): ~~The apparatus of claim 1 or 18~~ The apparatus of claim 1 wherein one of said at least two photo sensing units is placed at the opposite edge of a screen display, wherein at least two lenses are positioned in front of each said photo sensing unit wherein placement of both photo sensing units and lenses are designed to cover complementary areas of the measurement space.

Claims 29-33 (canceled)

Claim 34 (original): The apparatus of claim 1 wherein said light-receiving unit is comprised of at least one multi-line photo sensing array unit, used in combination with spherical lenses enabling measurement of three coordinates position of an object placed within said measurement space.

Claim 35 (canceled)

Claim 36 (original): The apparatus of claim 1 wherein said light-receiving unit is comprised of one photo sensing unit wherein said measurements are used for virtual keyboard implementations.

Claim 37 (original): The apparatus of claim 1 wherein said light-receiving unit is comprised of at least one photo sensing unit said measurements are used for machine vision implementation.

Claims 38-40 (canceled)

Claim 41 (original): The apparatus of claim 1 wherein said light-receiving unit is comprised of at least one photo sensing unit, wherein said photo sensing unit is integrated with additional circuitry in order to measure time of flight of light, wherein the location of the object is calculated by using said time of flight of light measurement.

Claim 42 (original): Apparatus providing input to a computing device, the apparatus comprising:

- a. a housing;
- b. at least one imaging device within said housing to provide output to said computing device, each said imaging device having more than one imaging area thereupon; and
- c. an optical system within said housing to define each said imaging area to view an area to be used by a user.

Claim 43 (canceled)

Claim 44 (currently amended): Apparatus according to ~~any of claims 42 and 43~~
claim 42 and wherein said optical system comprises at least two lenses.

Claim 45 (original): Apparatus according to claim 44 and wherein said optical
system comprises at least one shutter operative with one of said lenses.

Claims 46- 50 (canceled)

Claim 51 (currently amended): Apparatus ~~according to claim 46~~ according to
claim 42 and wherein said at least one imaging device comprises one imaging
devices device and said optical system comprises two sets of lenses, wherein
each set comprises at least two lenses, wherein each said lens within said lens set
is positioned to view a different direction.

Claims 52-53 (canceled)

Claim 54 (currently amended): Apparatus ~~according to claim 46~~ according to
claim 42 and wherein said at least one imaging device comprises one imaging
device and said optical system comprises two sets of lenses, wherein each set
comprises at least two lenses, wherein each said lens within said lens set is
parallel to an axis of said imaging device and said each lens of said lens set is
positioned at a different distance from said imaging device or has a different
focal length so as to capture near focus images of an object within a field of
view of said apparatus.

Claim 55 (currently amended): Apparatus ~~according to claim 46~~ according to claim 42 and wherein said at least one imaging device comprises two imaging devices and said optical system comprises two sets of lenses, wherein each set is locatable near one of said imaging devices and each set comprises at least two lenses, wherein each said lens within said lens set is parallel to an axis of its corresponding said imaging device and said each lens of said lens set is positioned at a different distance from its corresponding imaging device or has a different focal length so as to capture near focus images of an object within a field of view of said apparatus.

Claims 56- 62 (canceled)

Claim 63 (original): Apparatus according to claim 42 and comprising means for providing three dimensional locations of an object within a field of view of said apparatus from more than one imaging area.

Claims 64- 65 (canceled)

Claim 66 (original): Apparatus according to claim 63 and wherein said at least one imaging device comprises a linear imaging device and said optical system comprises at least three lenses where at least one of which is toroidal or cylindrical.

Claims 67- 73 (canceled)

Claim 74 (new): The apparatus of claim 3 wherein no light emitting source is positioned within said apparatus, and ambient light or external light source is used for transmitting light extending over said predefined measurement space.